

D2 1 st 7
2 E1
3 3. (Amended) The apparatus of claim 2 further comprising:
4 a second non-imaging optical concentrator, its high-divergence side
5 coincident with said second port.

D3 1 4. (Twice Amended) The apparatus of claim 3,
2 wherein said second port is adapted to direct light from said optical fiber
3 to a patient, and further comprising:
4 a second non-imaging optical waveguide having a third port and a fourth
5 port, said second non-imaging waveguide adapted to efficiently direct all the light
6 entering through said fourth port around a second bend;
7 said fourth port receiving light from the patient,
8 said third port directing the light received from the patient through said
9 fourth port to a second optical fiber;
10 a third non-imaging optical concentrator, its low-divergence side
11 coincident with said fourth port; and
12 a fourth non-imaging optical concentrator, for delivering a beam of light to
13 said second optical fiber, located between said second optical fiber and said third port.

D4 1 5. (Amended) The apparatus of claim 2 wherein said non-imaging
2 optical waveguide comprises a curved reflective segment located between said first port
3 and said second port.

D5 1 6. (Twice Amended) The apparatus of claim 5 wherein, in any
2 section parallel to the plane of said bend, said curved reflective segment appears as an arc
3 of a circle, wherein the plane of the bend is the plane through which the maximum angle
4 of bend is exposed.

D5
1 7. (Amended) The apparatus of claim 5 wherein said curved
2 reflective segment is an inner curve, further comprising a second curved reflective
3 segment as an outer curve, located between said first port and said second port.

D6
1 8. (Four Times Amended) The apparatus of claim 55,
2 wherein every section parallel to the plane of said bend is geometrically
3 identical, wherein the plane of the bend is the plane through which the maximum angle of
4 bend is exposed, and upper and lower surfaces of said non-imaging optical waveguide are
5 planar reflective surfaces, wherein said upper and lower surfaces are parallel to said plane
6 and bound said waveguide.

D7
1 9. (Amended) The apparatus of claim 6 wherein said arc has a radius
2 of the width of said first port, and a center at an end of said first port at an inside of said
3 turn around said bend.

D8
1 12. (Twice Amended) The apparatus of claim 55, further comprising
2 a non-imaging optical concentrator for delivering a beam of light having
3 half-angle divergence of 90 degrees, located between said optical fiber and said
4 first port; and

5 wherein said non-imaging optical waveguide comprises a first curved
6 reflective segment extending along an outside of a turn around of said bend, and a second
7 curved reflective segment extending around an inside of said turn around said bend.

1 13. (Twice Amended) The apparatus of claim 12 wherein, in any
2 section parallel to the plane of said bend, said first curved reflective segment appears as a
3 section of a first ellipse and said second curved reflective segment appears as a section of
4 a second ellipse, wherein the plane of the bend is the plane through which the maximum
5 angle of bend is exposed.

sub E1 >
1 15. (Twice Amended) The apparatus of claim 14 wherein
2 every section parallel to the plane of said bend is geometrically identical,
3 wherein the plane of the bend is the plane through which the maximum angle of the bend
4 is exposed, and
5 upper and lower surfaces of said non-imaging optical waveguide are
6 planar reflective surfaces, wherein said upper and lower surfaces are parallel to
7 said plane and bound said waveguide.

D9
1 16. (Twice Amended) The apparatus of claim 14 wherein:
2 said non-imaging optical concentrator is of the 3D type, and
3 in every section parallel to the plane of said bend, said first curved
4 reflective segment is of such size as to contact the outer edge of said first port and said
5 second curved reflective surface is of such size as to contact the inner edge of said first
6 port, wherein the plane of the bend is the plane through which the maximum angle of the
7 bend is exposed.

1 17. (Twice Amended) The apparatus of claim 55,
2 wherein said non-imaging optical waveguide comprises:
3 a first reflective segment extending along an inside of a turn around said
4 bend from said first port to said second port, such that in any section parallel to
5 the plane of said bend, said first reflective segment appears as a straight line; and
6 a second reflective segment extending along an outside of said turn around
7 said bend from said first port to said second port, such that in any section parallel
8 to the plane of said bend, said second reflective segment appears as a curve
9 comprising
10 a first parabolic segment extending from said first port,
11 an elliptical segment extending from said first parabolic segment,
12 and

13 a second parabolic segment extending from said elliptical segment
14 to said second port, wherein the plane of the bend is the plane through
15 which the maximum angle of the bend is exposed.

1 18. (Twice Amended) The apparatus of claim 17 wherein:
2 every section parallel to the plane of said bend is geometrically identical,
3 and
4 upper and lower surfaces of said non-imaging optical waveguide are
5 planar reflective surfaces, wherein said upper and lower surfaces are parallel to said plane
6 and bound said waveguide.

1 19. (Twice Amended) The apparatus of claim 17 wherein:
2 said first port is circular in cross section, and
3 in every section parallel to the plane of said bend, said first curved
4 reflective segment is of such size as to contact the outer edge of said first port and said
5 second curved reflective surface is of such size as to contact the inner edge of said first
6 port.

1 24. (Three Times Amended) The apparatus of claim 17, wherein said
2 second port is at an angle of less than ninety degrees from said first port, and further
3 comprising:

4 a third port around a second bend from said second port;
5 a third reflective segment extending along an inside of a turn around said
6 second bend from said second port to said third port, such that in any section
7 parallel to the plane of said bend, said third reflective segment appears as a
8 straight line;

9 a fourth reflective segment extending along an outside of said turn around
10 said second bend from said second port to said third port, such that in any section

E1 Cont'd
11 parallel to the plane of said bend, said fourth reflective segment appears as a
12 curve comprising:
13 a third parabolic segment extending from said second port,
14 a second elliptical segment extending from said third parabolic
15 segment, and
16 a fourth parabolic segment extending from said second elliptical segment.
17 to said third port

D10
1 25. (Twice Amended) The apparatus of claim 55, wherein said first
2 and second ports are rectangular.

D11
1 26. (Twice Amended) The apparatus of claim 55,
2 wherein said first and second ports are circular.

Please add the following new claim:

D12
1 *sh E1* --55. An apparatus for efficiently deflecting light from an optical fiber
2 around a bend, comprising:
3 a non-imaging optical waveguide, said waveguide being bound by and
4 having a first port and a second port, said non-imaging waveguide adapted to efficiently
5 direct all the light entering through said first port around said bend;
6 said first port receiving light having divergence angles of less than 90
7 degrees as measured relative the central axis of said optical fiber, said central axis of said
8 optical fiber being perpendicular to said first port;
9 said second port emitting light having divergence angles as large as 90
10 degrees relative to the central axis of said second port, said central axis of said second
11 port being perpendicular to said second port. --